

## **TRENCH FILLING PROCESS FOR PREVENTING FORMATION OF VOIDS IN TRENCH**

### **ABSTRACT OF THE DISCLOSURE**

Embodiments of the present invention relate to a process for filling a trench structure of a semiconductor device to prevent formation of voids in the trench structure so as to minimize current leakage and provide excellent electrical properties. In one embodiment, a process for filling a trench of a semiconductor device comprises providing a semiconductor substrate; forming a silicon nitride layer on the semiconductor substrate; forming an oxide layer on the silicon nitride layer; partially removing the oxide layer, the silicon nitride layer and the semiconductor substrate to form at least one trench; forming a sacrificial oxide layer on sidewalls of the trench; removing the sacrificial oxide layer; performing an etching procedure to remove portions of the silicon nitride layer protruding from the sidewalls of the trench so as to form substantially even sidewalls of the trench; and forming a trench-fill layer to fill the trench and deposit on the oxide layer.

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